PRELIMINARY
BENEFIT-COST & LEAST BURDENSOME ANALYSIS FOR AMENDMENT TO CHAPTER 173-503 WAC INSTREAM RESOURCES PROTECTION PROGRAM- LOWER AND UPPER SKAGIT WATER RESOURCES INVENTORY AREA (WRIA 3 AND 4)

Department of Ecology

February 2005
 # 05-11-005

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BENEFIT-COST & LEAST BURDENSOME ANALYSIS

FOR AMENDMENT TO

CHAPTER 173-503 WAC

INSTREAM RESOURCES PROTECTION PROGRAM-

LOWER AND UPPER SKAGIT

WATER RESOURCES INVENTORY AREA

(WRIA 3 AND 4)

Prepared by:

Washington State Department of Ecology

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Executive Summary

The Department of Ecology is proposing to amend Chapter 173-503 WAC. The existing rule sets minimum instream flow levels and describes water management including water availability and water rights for Water Resource Inventory Areas 3 and 4 (WRIA 3 and 4). These areas include the lower and upper Skagit River and tributaries and all contributing land area as set forth in chapter 173-500 WAC. A draft rule amendment has been developed that closes some subbasins, creates reservations for domestic and stockwater uses and clarifies the requirements for out of stream uses. Ecology has conducted this benefit-cost analysis as part of the rule adoption process.

The proposed rule language for WRIA 3 and 4 will have the impact of altering water allocations both instream and out of stream. Subsequent applications and water withdrawals will be allowed to use water under very specific conditions. Some subbasins are to be closed which will eliminate future permitted consumptive uses in these locations except under very limited conditions. In open subbasins, permitted uses will still be allowed subject to insteam flows. A reservation will be created that will allow residential and commercial users and public water systems to acquire water that will be uninterruptible subject to certain limitations. This will be a change to the current rule where all proposed water uses are junior to the existing instream flows. Reservation requirements might require some additional connections to public water systems. Those requiring water for stockwatering will be able to obtain it via a new reservation created for that purpose. Proposed transfers should not be affected and no direct impacts to existing water right holders are anticipated.

The costs associated with the proposed rule amendment include environmental and recreational costs, reduced availability of water for out of stream uses and implementation costs. Environmental and recreational costs are associated with creation of the reservation and the consequent reduction of water in the river and tributaries. On average, low flows occur about two-thirds of the days during certain parts of the year. The reservation will allow water to be used out of stream during these periods. Ecology anticipates the effect on instream resources and recreation will have little discernable impact. Out of stream uses are likely to be impacted in terms of a reduction in availability of water for permitted uses in closed areas. The exact cost will depend on location, frequency of proposed uses and alternatives and the value of existing interruptible rights. Other out of stream costs, non-use values and implementation costs are likely to be small.

Benefits of the proposed rule include environmental and recreational benefits associated with closing the subbasins. The benefit associated with creation of the domestic reservation involves the avoidance of the cost of storage installation. This benefit is estimated to range from $50.1 million to $73.3 million dollars. Other unquantifiable benefits include the increased certainty and clarity of water rights administration and public health benefits associated with connection requirements.

Ecology believes that the reservation establishment, ecosystem and recreation benefits and improved water allocation and public health benefits associated with the rule likely exceed the probable costs associated with the impacts listed above.

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1. INTRODUCTION

BACKGROUND

The Washington State Department of Ecology's (Ecology) Water Resources Program is proposing to amend an instream resources protection and water resources program for the Skagit River basin to:

- Retain perennial rivers, streams, and lakes in the Lower and Upper Skagit River basin with instream flows and levels necessary to protect and preserve instream values, and instream flows. Closures are proposed at specific points in the basin.
- Provide for an adequate and safe supply of potable water to satisfy the domestic needs of households and businesses and for stockwatering via the establishment of two reservations of water.
- Clarify Ecology's policies to guide the protection, utilization and management of Skagit River basin surface water and interrelated groundwater resources for use in future water allocation decisions.

The Skagit River basin is designated as Water Resource Inventory Areas 3 and 4 (WRIA 3 & 4) in chapter 173-500 Washington Administrative Code (WAC). The existing rule is chapter 173-503 WAC. Ecology is developing and issuing this Benefit-Cost Analysis (BCA) as part of its rule adoption process. It is not legally resolved if a BCA is required for this rulemaking pursuant to chapter 34.05 RCW. However, Ecology elected to perform a benefit-cost and least burdensome analysis to provide further analysis of the proposed rule and intends to use the information developed to ensure that the proposed rule is consistent with legislative policy.

DESCRIPTION AND PURPOSE OF THE BENEFIT-COST ANALYSIS

The benefit-cost analysis is provided to consider the economic efficiency of a proposed rule. This is essentially determining if the rule makes sound economic sense by determining that the probable benefits of undertaking the rulemaking are larger than the probable additional costs. RCW 34.05.328(d) further describes the requirements under the Administrative Procedures Act:

"Determine that the probable benefits of the rule are greater than its probable costs, taking into account both the qualitative and quantitative benefits and costs and the specific directives of the statute being implemented"

The benefit-cost analysis below provides an analysis that provides quantitative information where available and qualitative information where the economic or physical science is not to the point of providing reliable values for benefits and costs. There is no consideration of the distribution of impacts to various populations in this analysis.

CONTENTS OF THE DOCUMENT

The economic impacts of the proposed rule will be considered in this analysis. Section 2 contains a description of the baseline and proposed rule language and identifies the proposed rule impacts. It also contains a qualitative description of the benefits and costs.

Section 3 provides a quantitative description of costs and benefits where possible to obtain this information and provides a conclusion on the proposed rule amendment. It also discusses the results provided herein with reference to the existing rule. The Appendices contain more information on the existing water management system, research on instream flows and values and a discussion of the benefits and costs assuming that the county implementation agreements are not executed. Please see the Table of Contents for a complete description.

2. RULE REQUIREMENTS AND PROBABLE BENEFITS AND COSTS

INTRODUCTION

Existing chapter 173-503 WAC Instream Resources Protection Program – Lower and Upper Skagit Water Resources Inventory Area (WRIA 3 and 4) is the subject of this rule amendment. The evaluation of the impacts of the proposed rule is based on analysis and comparison of water right management before and after the effective date of the rule. The current water right administration is based on an extensive and complex legal and administrative framework and existing Chapter 173-503 WAC. The framework includes instream flows, administrative procedures for applications for both new water rights and changes to exiting water rights, and the use of water by permit-exempt wells (RCW 90.44.050). Implementation of Chapter 90.22 RCW and Chapter 90.54 RCW are also part of this legal baseline. In proposing reservations of water, and closing certain tributary basins, the rule amendment creates new conditions that must be considered when making future water right decisions. A brief description of compliance requirements is provided below. A detailed description of water management under the existing and proposed rules can be found in Appendix A.

WATER RIGHT ADMINISTRATION UNDER THE RULE

The proposed future water right management program will establish tributary subbasins and reserve specific quantities of groundwater in each subbasin, for the year-round future domestic uses of households and businesses. The rule also closes certain tributary basins to future appropriations, sets a reservation for future stockwatering and establishes eligibility conditions for use of the reservations. Expected impacts to water management include the following:

Surface Water: For basins not subject to closures, the decision process will be the same as prior to the rule amendment. Ecology will condition a water right in such a way that flows are protected and a permit would be approved granting an interruptible right. Under the proposed rule, all new surface water rights, that do not use the reservations as their source, will continue to be "junior" to the instream flow levels in the rule and will be required to stop withdrawing water when minimum flows are not met in the surface water source. In general, this is not likely to represent a significant change for future proposed surface water withdrawals.

Applications for new consumptive surface water rights from closed sources would be denied, unless the applicant proposes, and Ecology accepts, mitigation of the water use. If the basin is closed for an entire year, then mitigation is possible but generally not practical. The use may also be approved if it is "clear that overriding considerations of the public interest will be served." (RCW 90.54.020(3)(a)).[1] For areas currently administratively closed under Ecology's Surface Water Source Limitations (SWSL) list, this would represent no change from the current situation. For areas that are not currently

[1] This is also true in basins not subject to closure.

closed, this may represent a change because applications for new surface water rights would be denied unless impacts on instream flows can be offset.

Groundwater: The decision process is the same as prior to the rule. Groundwater applications in hydraulic continuity with the Skagit River would still be subject to the instream flows unless they are eligible for the domestic reservation. Applications for new consumptive ground water rights from closed sources would be denied, unless the applicant proposes, and Ecology accepts, mitigation of the water use or the applicant shows that the withdrawals will not affect surface water. If the basin is closed for an entire year mitigation is possible but not generally practical. A use may be approved if it is "clear that overriding considerations of the public interest will be served." (RCW 90.54.020(3)(a)) For areas currently administratively closed under Ecology's SWSL list, this would represent no change from the current situation. However, for areas that are not currently closed, this may represent a change because applications for new ground water rights would be likely denied by Ecology unless impacts could be completely mitigated.

In the amended rule, based on the hydrogeology of the basin, and the location and depth where groundwater withdrawals generally occur, future groundwater withdrawals have a high likelihood of capturing water that would result in impacts to surface water flows and levels in the Skagit River Basin. The rule does not create the need for, and does not change the standards for, the analysis regarding whether these impacts cause impairment. This may result on an impact to future users of new wells in the basin. For example, in basins not subject to closures, businesses that initiate new agricultural, commercial, or manufacturing projects relying on wells for process water will be required to suspend water use during periods of low flows, develop storage mechanisms or to develop mitigation strategies acceptable to Ecology that allow them to mitigate their impacts. This is the case under the current rule and does not represent an impact of the rule amendment. Businesses in closed basins will be required to mitigate their impacts.

Permit Exempt Groundwater: A reservation of ground water for future domestic uses provides a management framework for these types of withdrawals. One significant factor influencing the impacts of the rule is whether the local governments implement an administrative action or ordinance to effectuate the reservation. If an administrative action or an ordinance is not put in place, the reservation will not be available to new uses until such time as these actions are taken. The analysis below assumes the local governments act to make the reservations available within their jurisdictions. Appendix C discusses the case where action is not taken.

For businesses interested in using an exempt well, there would be several alternatives. Applicants could solicit a hydrogeologist to certify that a well would not cause impairment of a water right in areas where hydraulic continuity between the surface water and groundwater is not likely. This would allow an applicant to develop a well as though the rule was not in place, but at the additional cost of the analysis. For some wells in basins that drain groundwater to saltwater bodies, this cost would likely be very small and is the currently the case. For wells that would be drilled in areas where they are likely to be in hydraulic continuity with closed basins or streams with instream flows, and

impairment would result, options include obtaining water from the reservation or accepting an interruptible water right with corresponding curtailment or with storage.

The reservation requires that an applicant be located more than 500 feet from an existing water system. If an applicant is closer to the water system than this, they will be required to connect to the system when the connection can be made in a timely and reasonable manner. This may result in increased costs, including connection charges, construction charges and monthly water rates.

Changes or Transfers of Water Rights: Existing water rights will continue to be changed or transferred as permitted by Chapters 90.03 and 90.44 RCW and the process is the same as before the proposed rule amendment. Changes for surface water rights are still evaluated considering the instream flow right. Requirements related to changes in the point of diversion from a surface point to a ground water point, if it is from the same water source, is the same in the existing rule and the proposed rule amendment. Transfers that are restricted because they are not in the same source will also be treated the same after the rule amendment as under the existing rule. Transfers of water rights may become part of mitigation strategies used by businesses to offset their new water needs.

Reservations of water: The reservations of water, use of water under the reservations, and associated conditions for that use, are all part of the rule proposal. In large measure, the domestic reservation will allow residential and some business development to continue as before with the benefit of having a continuous, reliable source of water during low flow periods, except for a few restrictions. These restrictions include a limit on outside lawn watering, a requirement to connect to public water systems under certain circumstances, and the finite quantity of the reservation. Domestic water use must also meet efficiency standards and outdoor uses will be limited.

Closures of Water Sources in WRIA 3&4: The rule would include the current limitations and administrative closures for surface water sources, and add to them for applicants who cannot access the reservations. Ecology anticipates that applications for consumptive uses from closed sources will be denied unless the applicant can acceptably mitigate for the impacts (the same as prior to adoption of the rule) or take advantage of the reservation.

COSTS AND BENEFITS OF RULEMAKING

As described above, one of the impacts of the proposed rulemaking will likely be experienced by future water right applicants. Existing water right holders will not be directly affected. However, there will also be impacts to the environment associated with increasing or decreasing out of stream water uses and some recreational activities could also be affected. A general description of benefits and costs associated with instream and out of stream uses of water is provided below.

Costs

The economic cost associated with this rulemaking is the loss in the value of the water in its alternative use. This may be the lost value of the water in the streams and tributaries when additional water is allowed to be withdrawn or the value of the water for out of

stream uses when it is required to remain in the streams. These can be described more specifically as follows:

Ecosystem Goods and Services
The creation of the reservation will allow some water users that would currently have to eliminate use during low flows to obtain water from the river and tributaries. This will result in reduced instream flows. The opening of the Nookachamps basin will also result in groundwater withdrawals that may, in turn, reduce streamflows more than would have been the case without the proposed rule amendment. Additional connection requirements may reduce the impacts from water use in some areas but increase the impacts in other areas. Reduced water in the river and creeks could yield reduced habitat for fish and other marine and avian life and reduce the river's ability to better assimilate waste. This could impact water quality and be an impact to any businesses relying on the river for waste assimilation, or for biological processes.

Recreation
Reducing the amount of water in the river and tributaries could also impact some recreational activities by reducing the quality of the experience from what would have been the case without the rule amendment. Boating, fishing, windsurfing, kayaking, and canoeing, swimming or diving could be impacted along with activities adjacent to the water like picnicking and camping. Businesses associated with these activities could also be affected.

Reduced Availability of Water for Out- of-Stream Uses
(a.) Closing additional subbasins: Some subbasins that are currently open to new withdrawals will be closed. For other than domestic (human needs of a household or business) uses authorized under the reservation, this regulation will eliminate new permitted water withdrawals, unless non-consumptive, in these areas and new water uses will be required to obtain water from an existing water purveyor, through transfers or other methods. Domestic uses will be able to obtain water in these closed areas through the proposed reservation.

(b.) Reservation creation
The reservation will allow households and businesses to access water the entire year. However, the water use will be reduced to only allow water use for domestic purposes year-around. Some that use more water during non-low flow periods may experience a cost. For households or businesses that would typically use a relatively large amount of irrigation water or process water (up to 5,000 GPD), a water right permit will be required for this use in open subbasins. This use in a closed basin will not be allowed without mitigation.

(c.) Connection requirements: Those desiring to access water from the reservation or applying for a water right but located within the service area of a public water system will be required to connect to the system if connection is timely and reasonable. In general, this will impact those desiring to use water for domestic needs since greater allocations will be required to obtain a permit.

Non-Use & Option Value
Non-use values such as spiritual and existence values could be impacted as part of this rulemaking. These values do not derive either from direct or potential use of water resources in the basin, and represent a different category of value than the use values listed above.

Uncertainty and option values may also be important. There is a significant amount of uncertainty associated with water and instream flows. The future may determine that more or less water should be maintained in the river. However, a water right is a firm commitment to provide water in perpetuity. By allowing all permit-exempt water rights from this point on to be able to obtain water during low flow events, the option to restrict these flows in the future is eliminated.

Implementation Costs
The proposed rule will involve some implementation costs. These include the costs associated with providing technical and educational information for rule compliance, the costs associated with counties completing implementation agreements, and the costs associated with Ecology managing and accounting for the reservation.

Benefits
The benefits associated with the proposed rule are associated with the value of water in its proposed use. This includes the following:

Ecosystem Goods and Services
There will be some ecosystem benefits from stream closures and from connectivity requirements. These requirements will likely result in more water in the rivers than would have been the case without the rule amendment. Connection requirements might reduce impacts to locally sensitive streams. An avoided reduction of instream flow in tributaries could yield an avoided reduction in habitat for fish and other marine and avian life and avoid a reduction in the river's ability to better assimilate waste. This could be a benefit for any businesses relying on the river for waste assimilation, or for biological processes as well as benefit adjacent property owners.

Recreation Benefits
There may be some recreational benefits associated with stream closures and from connectivity requirements. These requirements will likely retain more water in the rivers than would have been the case without the rule amendment. Connection requirements might reduce impacts to locally sensitive streams. An avoided reduction of instream flow in tributaries could yield a beneficial impact to rafters, those who canoe, fishing quality, and riverside activities.

Benefits to Out-of-Stream Water Use
(a.) Creation of the reservations: Currently any exempt well in continuity with the Skagit River or tributaries is legally required to curtail use during low flow periods. Under the reservation, the domestic needs of residential and business uses will be met even during

low flow periods. For households and businesses developing land for residential construction or that only have need for domestic water, this should be a benefit from this rulemaking.

The creation of the stockwatering reservation will provide year-around access to water for stockwatering. Currently, water accessed via permitted or permit-exempt wells must not be withdrawn during low flow periods. This should be a benefit to those households or businesses that are involved in managing stock.

(b.) Improved Water Allocation Process

The new rule will clearly indicate closed and open basins. This will reduce the uncertainty surrounding whether or not new water rights will be approved or denied. It will also likely reduce the amount of review and analysis required and potentially reduce the amount of disputes over water use. It will also provide greater certainty to residential users since domestic use definitions and criteria will be publicly available. This will likely allow greater certainty in investment decisions, and reduce resources used in applying where it is clear that they are unlikely to get a water right.

Public Health Benefits

The Washington State Department of Health (WSDOH) has indicated that having many individual wells in any given area increases the risk of groundwater contamination. Requiring entities within public water system service areas to connect if connection is timely and reasonable, will reduce this increased risk of contamination.

Implementation Costs

The proposed rule will eliminate the requirement that households will have to monitor when low flow requirements are in effect and when they are not. This reduced cost should be a benefit to those using the reservation.

3. ESTIMATED COSTS AND BENEFITS

INTRODUCTION

The analysis provided below describes the estimated costs and benefits of the proposed rule. Though it is possible to get a quantitative estimate of some of the costs and benefits of the proposed rule amendment, in most cases it is difficult to develop quantitative estimates for each cost and benefit. In those cases, only qualitative conclusions are provided.

RECURRENCE FREQUENCY

Some of the impacts of the rule will occur during periods when low flows are not met in the river or its tributaries. For example, exempt wells are legally required to curtail use during low flow periods. After the proposed rule amendment, these uses would not have to be curtailed. Therefore, an important part of the analysis of impacts is in determining how often low flows are likely to occur in the future. This is a function of the future flows in the river and the minimum in-stream flow levels proposed in the rule.

To assess the frequency of low flows, historical data was obtained for one location along the Skagit River.[2] These past flow values were compared with the existing in-stream flow levels and used to determine how frequently minimum flows would not have been obtained in the past if the existing instream flows had been in effect. These historical flows provide a relatively long time series and therefore a reasonable approximation for the number of times in the future that minimum instream flows are likely to not be met.[3] Figure 3.1 indicates the results.

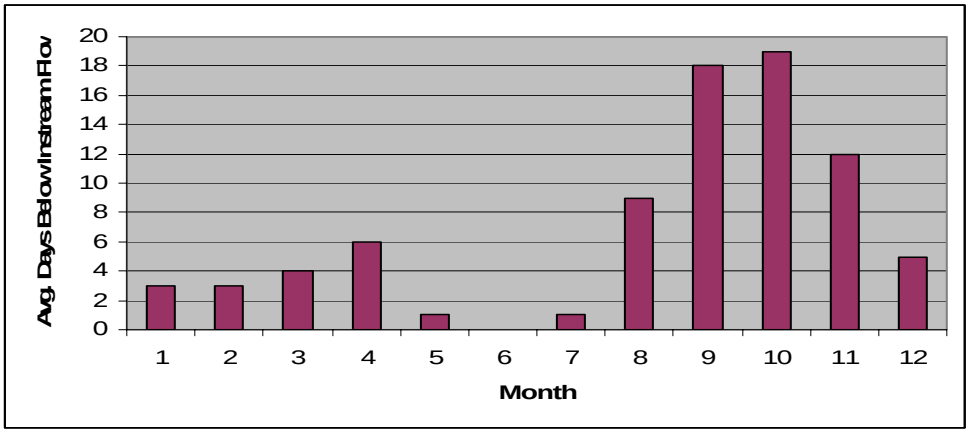

Figure 3.1. Average Number of Days Existing Flows Would Have Been Below Minimum In-Stream Flows Established in WAC 173-503 (Period 1941-2003)

As can be seen, existing flows meet proposed flows most of the year except the late summer season. In September and October, flows may not be met in the river almost two-

[2] The flow gauge is located on the Skagit River near Mount Vernon. Data exists from 1941-2003.

[3] However, if climate change impacts lead to drier summers as some forecast, then it may be an underestimate of the impacts. Unfortunately, it is difficult to say how quickly climate change impacts may occur and they are not further considered in this analysis.

thirds of the time at this stream gauging location.[4] During other months, some days occur when flows don't meet the minimum required flows but appear associated with drought periods in given years.

IMPACTS TO WATER RESOURCES

The proposed rule amendment will result in some water that will be used during low flow periods and some that will not be used due to basin closure requirements. In general, it is possible to estimate these impacts given expectations about exempt well use and permitted surface and groundwater uses.

Exempt wells that access the reservation will be able to obtain water during low flow periods. Estimation of permit-exempt well use based on estimated population growth for the subbasin indicate that between 2,500 and 3,000 new exempt wells may be installed though 2025.[5] Assuming average use of 350 gallons per day (GPD), it is expected that by 2025, approximately 960,000 GPD will be used during a low flow year that should not have been used under the existing rule. It is important to note that this amounts to approximately 1.5 CFS and that the Skagit River often has flowrates between 10,000 and 30,000 CFS. Moreover, uses other than those allowed under the reservation will no longer be allowed in closed basins. In general, it is difficult to assess how many future permits this might affect. Since 1985, approximately 105 permitted surface or groundwater withdrawals have been approved, only one of which has occurred since the existing rule was put in place. In general the uses tend to be for irrigation, domestic or public water system uses which are uses that are likely to require an uninterruptible water right.

COST ESTIMATION

Ecosystem Goods and Services

The environment provides several services required by fish and wildlife and directly or indirectly beneficial to humans. A significant service on the Skagit is habitat for salmon, although the waters also provide habitat for other fish, birds that prey on aquatic life, and other aquatic creatures. In addition, the river also provides dilution benefits for discharges of wastewater and stormwater.

Many different fish stocks are present in the Skagit and its tributaries. Some species of salmon spawn during the period from August to October and some spend some other portion of their life-cycle in the river during the summer months. Depending on the species life-cycle, a reduction in flow could adversely impact both spawning and rearing. Flow reductions may increase the effect of high temperatures, provide less estuarine and floodplain habitat, potentially increase the amount of fine sediment, and reduce fish passage. This may translate into some reduction in the number of juvenile fish that survive and/or grow to adulthood along with increasing the risk that of endangered species listings.

[4] This is an average value and actual periods are likely to longer some years and shorter in other years.
[5] Existing population determined using U.S. census data in individual census blocks. Population estimates taken from Skagit County non-UGA rural growth estimates, GMA Steering Committee, 2003. Well logs indicate well drilling rates averaging approximately 280 wells per year have occurred in the past.

In general, it is very difficult given current modeling techniques to quantify the impacts of a small change in habitat on fish populations. There are many factors that affect fish populations of which streamflows are only one. Fish survival depends on flows, temperature, water quality, location of snags, ocean predation, climatic cycles, commercial fishing, etc. Most of these factors are difficult to predict with a sufficient degree of confidence. Therefore, Ecology has not attempted to quantify the benefits of a reduction in flows on the fish population in WRIA 3 and 4. In general, Ecology believes that the small reduction in flows[6] associated with increased out of stream uses may result in a small reduction in fish habitat during infrequent low flow events, but is unlikely to have significant impacts on fish populations.

Waste assimilation services are also provided by the Skagit River. Ecology regulates this service in rivers via National Pollutant Discharge Elimination System (NPDES) discharge permits. These allow discharge in designated mixing zones if certain water quality requirements are met. Ecology uses the 7-day, 10 year (7Q10) low flow as the design flow to consider when determining the requirements of these permits. They also consider other parameters such as temperature, oxygen levels, etc. In general, Ecology expects that a 2% reduction in the 7Q10 flows will result in insignificant impacts to pollution assimilation capacity.

Recreation Impacts

The reduction in instream flows in rivers of the Skagit watershed has the potential to impact recreational activities. Reduced instream flows could adversely impact rafters, kayakers, canoeing, fishermen, swimmers, picnickers, campers and hikers.

The Skagit river provides for a significant commercial rafting industry along with camping and day use at parks and recreational fishing. Table 3.1 provides an indication of use on the river.

Table 3.1 Skagit River Recreational Uses[7]

Data Source	Use	Number of Days
US Forest Service	Rafting	800-2000 use days
	Eagle Watching	10,000 use days
WA State Parks and Recreation	Camping	14,980 people/year
	Day Use	75,570 people/year
Skagit County	Camping	25,000 people/year
	Day Use	20,000 people/year

[6] The criteria used to determine the reservation allocations in the sub-basins was the smaller of build-out needs or a 2% reduction in the 7-day, 10-year low flow. Ecology Biologists believe this reduction in flow will not significantly affect fish.

[7] Use data provided via phone conversations with the relevant organizations. No City governments kept use data on park use.

As can be noted, the Skagit River has a significant volume of rafting and other uses. In general, conversations with rafting firms indicate that a reduction in flow equal to approximately 1-2 CFS during the low flow periods is unlikely to be a significant impact. It is reasonable to conclude that this reduction in flow will also not significantly affect private rafting, tubing, kayaking, camping or day uses.

At least some recreational fishing does occur on the river. Winter and summer steelhead fishing occurs and previous catch rates are provided in Table 3.2 below.

Table 3.2. Skagit River Steelhead Catch Rates (4/00-3/01)[8]

Fish Type	No. of Fish Caught
Summer Steelhead	128
Winter Steelhead	1414

As mentioned above, the allocation of some water to provide domestic uses during low flows is unlikely to impact the fish populations in and of themselves. The quality of the fishing experience is also unlikely to be affected by such a small reduction in flows.

Reduced availability of water for out of stream uses

a. Closing additional subbasins: As mentioned previously, some subbasins that are currently open to new withdrawals will be closed. For other than domestic (human needs of a household or business) uses authorized under the reservation, this requirement will eliminate new water withdrawals, unless non-consumptive, in these areas and new water uses will be required to obtain water from an existing water purveyor, through transfers or other methods. Analysis of past permits in WRIA 3 and 4 indicate that slightly more than 100 have been issued in the last 20 years. In general, the major use categories have been for irrigation, domestic and municipal uses. All but one of these permitted uses was issued prior to the existing instream flow rule, but it is likely that some were conditioned on instream flows. In these cases, allocations that are for domestic uses would have had to provide storage or another approach to obtain water during periods of low flow or accept that the water right is interruptible. The closure will mean that even interruptible water rights will not be allowed. The exact nature of the impact depends on the extent of the closures, the number and location of future wells and the degree to which interruptible or mitigated water rights were acceptable prior to the rulemaking. If water becomes completely unavailable, the cost will be the smaller of leasing or purchasing water rights, the reduction in property value associated with the land without access to water, the cost of trucking water into the area, or perhaps other costs associated with mitigating the impact. The total cost impacts of these requirements will depend on the site specific situation.

(b.) Reservation Creation

The reservation will allow households and businesses to access water the entire year. However, the water use will be restricted to only allow water for domestic purposes if withdrawn from the reservation. For households, the additional restrictions on use are

[8] From Washington State Catch Report, 2002, WDFW.

unlikely to be a significant change from current conditions since water cannot be used at all during low flow periods and some outdoor watering will still be allowed. Businesses that currently use exempt wells for process water will not be able to get the water from the reservation. In open basins, they can still get an interruptible right for their water and provide storage as is the current case, but will be required to get a permit (as is the current case). Domestic uses can be provided for using the reservation. This may represent a cost if it delays access to water. In closed basins, accessing process water through an exempt well will not be permitted. The cost impacts of these requirements will depend on the site specific situation.

(c.) Connection requirements: Those desiring to access water from the reservation or applying for a water right but located within the service area of a public water system will be required to connect to the system if connection is timely and reasonable. In general, this will impact those desiring to use water for domestic needs because those requiring greater flows will be required to obtain a permit. However, current users that would use a permit exempt well are legally required to curtail use during low flows. It is unlikely most residential or businesses would consider this interruptible right a sufficient water source and so they would have to provide on-site storage or mitigate in some other way. Moreover, it is unlikely that the connection costs would be greater in most cases if the alternative is a well with onsite storage. A well with storage might range from $25,000-$35,000 depending on the well depth and geology. Connection to an existing system might range from $8,000-$35,000 and some (perhaps all) of the cost at the upper end may be returned via latecomer agreements. Moreover, Skagit County's Critical Areas Ordinance also requires connecting to a public water supply system under certain circumstances. Given current costs and existing regulatory requirements, it is unlikely these requirements impose new costs to many proposed residential and business endeavors.

Non-Use Values & Uncertainty and Water Rights

Healthy rivers and supporting salmon have been shown to have large and positive non-use value. Salmon are a cultural and spiritual source of inspiration and people have demonstrated their willingness to pay for salmon restoration without ever consuming the fish or even visiting a site. These values are very difficult to quantify, however, as described previously, the ecosystem impacts are likely to be very small such that the impact to non-use values is also likely to be moderate. Several of the papers listed in Appendix B include non-use values in the results.

There is a significant amount of uncertainty associated with water and instream flows. The acquisition of future information may indicate that more or less water should be maintained in the river. A water right is a firm commitment to provide water to users in perpetuity. By creating a reservation allowing water use even during low flows, Ecology is reducing its flexibility to respond to information indicating more water should be retained in the river. This could be considered a cost of the rulemaking but is difficult to quantify.

Implementation Costs

The rulemaking will involve additional costs including Ecology staff time in preparing technical and educational documents associated with compliance and accounting for the reservation. The cost for staff, materials and processing is likely to be approximately $3,000 for the educational materials. Accounting for the reservation will also involve increased costs for Ecology employees. There will also be a cost associated with the counties processing an implementation agreement.

BENEFIT ESTIMATION

Ecosystem benefits

Even though it is likely that the total amount of withdrawals from the basin will increase, the closure of several of the subbasins may reduce streamflow depletions resulting from other types of withdrawals in the Skagit. A closure is an acknowledgement by Ecology that water is not available for appropriation and implies that water left in the streams is highly valuable. All unappropriated water within the closed subbasins is to be appropriated for purposes of protecting and preserving fish and wildlife and other instream values. The total additional water that will be allocated will be the water that would have been allocated to permitted uses if the rule amendment were not in place. As mentioned above, this is a location and application specific amount and it is difficult to assess the benefits

Recreation Benefits

Recreational benefits may occur in these same closed sub-basins. However, they are likely to be more limited since rafting is more likely to occur on the mainstem. Informal recreational activity may experience some benefit however.

Benefits to out of stream uses

(a.) Creation of the reservations

The creation of the reservations will provide benefits including allowing residential and business uses of water during low flow periods. As was noted previously, it is likely that low flow periods would occur about 2/3 of the time during some months under the existing rule. Legally, those households obtaining water without the proposed reservation would be required to completely curtail use. This would have significant impacts and probably not be considered a reliable water source for a household or business. In order to have water available for use in the house or business, it is likely some sort of on-site storage or other alternative would be required. This would come in the form of a storage tank and treatment system that would allow water to be pumped from an exempt well during periods of high flows and stored for periods when low flows occur. Given current estimates of low flow, the estimated cost of constructing this type of system would add about $25,000 to $30,000 to the typical cost of construction of a permit exempt well. This does not include the cost of electricity for the treatment system or maintenance costs.[9]

Given that the proposed rule amendment will allow households to avoid the cost of storage for domestic usage, this avoided cost can be taken as a benefit of this rule

[9] This cost may be an over-estimate of the benefits if the increased cost of developing a well makes it cost-prohibitive. In that case the land may revert to its next most valued use and the actual benefit of water during low flows would be less.

amendment. As mentioned previously, the estimated number of exempt wells to be constructed in the next 20 years is in the range of 2,500-3,000.[10] Given this number of newly installed exempt wells, the total benefit of the reservation can be estimated to be in the range of $50.1 million to $70.3 million.[11]

Increased Certainty and Clarity in the Water Allocation Process

Increased certainty in water rights acquisition should reduce the delay and uncertainty surrounding obtaining new water rights. This will allow developers and others to plan ahead in property development and better value investment opportunities. The rule amendment may also improve rule clarity and provide a more certain and expedited permitting process.

Public Health Benefits

Drilling holes in the ground associated with well construction has the potential to become a pathway for contaminants from the land surface to the aquifer below. Single family homes tend to be constructed in the most shallow aquifers further exposing them to contamination. In general, WSDOH has indicated that having many exempt wells increases the risk of contamination of groundwater supplies. Requiring connection of those proposed uses where service can be provided in a timely and reasonable manner can be considered a benefit of this rulemaking. However, as mentioned previously, the number of potential water users this may affect is likely to be relatively limited and this is likely to be a rather small benefit.

CONCLUSIONS

As has been mentioned previously, many of the benefits and costs associated with the proposed rulemaking are not quantifiable. This is due to the fact that the data is not available and/or the future is too difficult to predict. Often the analysis comes down to a tradeoff as to whether some often uncertain number enlightens the analysis more than simply stating the result qualitatively. In the description of benefits and costs, information was presented that was intended to not necessarily provide a numerical point estimate, but to give some sense of scale. Conclusions were drawn regarding the magnitude of the impact based on that information. The costs of the rulemaking to ecosystem services, recreation, reservation use, connection requirements, non-use and option values and the implementation costs all appear to be relatively moderate. The most uncertain cost is the impact of the basin closures, but even these are likely to represent relatively moderate costs. The benefits to ecosystems and recreation together with the improved water allocation process and public health benefits are also likely to be relatively small. The most significant benefit is access to water from the reservation and this benefit appears to be relatively large. Ecology thus believes it is reasonable to conclude that the probable benefits from the proposed rule amendments exceed the probable costs.

[10] This estimate is lower than the historical rate of well log construction which would yield about 5,600 wells. Ecology is using the lower value to be conservative in its estimate.

[11] This may be an overestimate since the estimated number of wells does not consider how the increased cost of well construction might impact the desirability of substitutes to permit-exempt wells. However, the rate used is lower than historical well log construction rates and therefore might offset this effect.

The above analysis assumes the counties pass the required ordinance or administrative agreement to implement the reservation. If they do not, and the reservation does not go into effect, then the costs to ecosystem goods and services and recreation fall as do the costs associated with reservation creation, connection requirements, non-use and option values and implementation costs. However, the benefits associated with this outcome also fall including the improved water allocation process, the public health benefits, and most significantly, the benefits associated with the reservation. Appendix C contains a further description.

IMPLICATIONS FOR THE EXISTING RULE

Ecology is currently a party to a lawsuit with Skagit County on grounds that the existing rule was not appropriately evaluated with regards to the Small Business Economic Impact Statement and the exempt well portion of the benefit-cost analysis. In an effort to address these concerns, Ecology has considered the results of the rule amendment analysis in that light. The right to have water for domestic uses during low flows generates large benefits as noted previously. However, these could also be regarded as the cost of the previous rulemaking since the right to obtain water during low flows was effectively eliminated. The previous benefit cost analysis declared that the benefits from the rulemaking ranged from $3.1 million to $9.4 million which is significantly less than the cost obtained above from the exempt well restrictions. It is important to note however, that there are many other non-quantifiable benefits, many of which are discussed above in addition to being documented in the rulemaking file for the original rule that should be considered. These benefits may make the original rulemaking finding that probable benefits were larger than probable costs accurate.

4. LEAST BURDENSOME ANALYSIS

RCW 34.05.328 (1)(e) requires Ecology to perform a Least Burdensome Analysis to:

"Determine, after considering alternative versions of the rule and the analysis required under (b), (c), and (d) of this subsection, that the rule being adopted is the least burdensome alternative for those required to comply with it that will achieve the general goals and specific objectives stated under (a) of this subsection."

The proposed rule amendment was developed at least partly in response to concerns that the current rule does not allow for uninterruptible water rights to meet the domestic needs of households and small businesses. This may represent a significant burden to individuals or entities that own property in the basin. However, one alternative for Ecology would have been to not propose a rule amendment at all. This would have allowed the existing rule to remain in place and likely represented a continuing burden on some individuals and businesses that live and operate in the basin.

One alternative that Ecology considered in early rulemaking was closing the Nookachamps basin entirely which would have precluded all future new allocations in continuity with surface waters. However, Ecology believes that this may have significantly impacted households and businesses in this subbasin in the short run while other sources of water supply are developed and that it did not meet the goals and objectives of the rulemaking. Therefore, Ecology elected to allow additional withdrawals via the proposed reservation

Ecology also considered putting together a basin-wide program that was linked to future development and that would have provided public water or basin-scale mitigation to offset the impacts of all future exempt wells. Ecology felt this was an unduly expensive and administratively complex way to achieve the goals of providing water for domestic uses at relatively low cost.

The proposed rule achieves the goals and specific objectives as stated in the proposed rule amendment at lowest cost given the above alternatives.

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APPENDIX A-EXISTING WATER MANAGEMENT, RULE IMPACTS & RULE ANALYSIS

INTRODUCTION

Ecology anticipates that a significant portion of the proposed rule's implementation will be related to water rights and water management. Water rights and water management are governed by a series of statutes and court cases. Compliance with the rule will occur primarily within the context of complying with state water laws. Evaluating the impacts of the proposed rule amendment involves describing the baseline from which the change caused by the rule is measured. The baseline includes water right administration for both new and changes of water right applications under chapters 90.03 and 90.44 RCW, existing WAC 173-503 and case law. It also includes the use and development of water by permit exempt wells pursuant to RCW 90.44.050. For the consideration of instream values, chapter 77.55 RCW and current implementation of chapter 90.22 and 90.54 RCW as they relate to water rights and water management is also part of the baseline.

In proposing the creation of the reservations of water, the amendment creates a mechanism that allows for future uninterruptible domestic water uses and stockwatering. In the case of the stream closures, the proposed rule's effect will likely be on future determinations of water availability. Consideration of water availability is part of the water right application process. The four-part test for a water right from RCW 90.03.290 remains unchanged and includes examination of water availability. The proposed rule will quantify water availability for some uses through the reservation and establish new water rights for this watershed. Conditions may be imposed on a future water right to implement the rule. How the proposed rule changes consideration of requests for new water and or changes to water rights and in particular how environmental values are reflected in the decisions prior to and after the rule amendment are described below.

BASELINE DEVELOPMENT

Under State water law, the waters of Washington collectively belong to the public and cannot be owned by any one individual or group. Proposed diversions or withdrawals of any amount of water for any use from all surface or groundwater sources require a water right be obtained. A water right is a legal authorization to use a certain amount of public water for a designated purpose. A water right is necessary if you plan to divert or withdraw any amount of water for any use from:

- Surface waters (water located above ground) such as lakes, rivers, streams and springs.
- Ground waters (water located under ground).

Although all uses require a water right, certain groundwater withdrawals are exempt from permitting requirements. An application for a ground water right permit is not required if

your daily ground water use from a well or wells will be 5,000 gallons a day or less for any of the following combinations of uses:[12]

- Drinking and cleaning water for livestock (stock-watering).
- Single or group domestic purposes such as drinking, cooking and washing.
- Industrial purposes.
- Watering a lawn or noncommercial garden that is a half acre or less in size.

Although the law allows an exemption from the water right permit process in these cases, all other water laws and regulations still apply to these uses.

Washington water law requires users of public water to receive approval from the state prior to the actual use of water. Approval to put water to beneficial use is granted in the form of a water right permit. The proposed use must meet four primary requirements (known as the "four-part test") in order for Ecology to issue a water right permit:

1. The water will be put to beneficial use;
2. There will be no impairment to existing rights;
3. Water is available; and
4. The water use will not be detrimental to public welfare.

Ecology conducts an investigation of the application to confirm the information on the application and applies the four-part test mentioned above. In applying this four-part test, some of the facts Ecology considers are based on the particular water source, existing water rights, and watershed. These include the instream flow recommendations made in the past, instream flow rules (if they exist) and whether and how groundwater is connected to surface water sources. The results of the investigation and four-part test review are summarized in a report of examination (ROE). The ROE contains Ecology's staff-level decision on a water right request. Ecology can recommend a denial, an approval, or an approval with conditions. Once approved by an Ecology decision-maker, Ecology issues a final ROE and orders approving the ROE. If approved, the permit will likely have specific conditions.

Instream flow considerations within water right application administration has been the law since 1949 (See RCW 77.55.050). Generally, a flow of water sufficient to support game fish and food fish populations must be maintained at all times in the streams of this state. Under that statute, Ecology sends copies of water right applications to the Washington Department of Fish and Wildlife (WDFW) to see if approving the proposed withdrawal would compromise game and food fish populations. In 1969, by adoption of Chapter 90.22 RCW (Minimum Water Flows and Levels) and again in 1971, by adoption of the Water Resources Act, the Legislature added additional policies for instream flow considerations and the instream flow rule program. Instream flows once adopted by rule are water rights protected from impairment from those rights junior in priority date to the instream flows (RCW 90.03.345). Ecology is prohibited, by statute, from allowing

[12] Publication #F-WR-92-104.

withdrawals of water that conflict with an instream flow regulation, unless there is a clear showing of overriding consideration of public interest (RCW 90.54.020(3)(a)). Numerous water sources in WRIA 3 & 4 are listed on Ecology's Surface Water Source Limitation List (SWSL) based on past comments of resource agencies pursuant to RCW 77.55.050.

The consideration of a proposed withdrawal's impact on fisheries resources and flow is performed by professional fisheries biologists based on professional judgment using the existing data and/or knowledge of the basin. If there is concern that approval of use might compromise instream values, an application can either be denied or approved with use conditioned on minimum flow levels. A junior water right must stop use, if a senior right is not satisfied. Consequently, rights conditioned upon minimum flow levels are interruptible water rights that must be discontinued during times when streamflows are below the established flow value

In the case of the Skagit River, there is an existing in-stream flow rule in place and water is currently allocated according to existing water law. The current water management program can be broken down as follows:

Surface Water Allocations (water right permit)
New applications for surface water rights are forwarded to the WDFW for review and comment. The four-part test is applied. If there is a concern that water uses might adversely impact fish, WDFW will recommend that the right not be issued or that any use granted be conditioned on minimum flows. In most cases Ecology will accept WDFW's recommendation and condition the right in such a way that flows are protected. Surface water allocations are also subject to interruption under Chapter 173-505 WAC. A permit is approved granting an interruptible right.

Groundwater Allocations (water right permit)
New applications for ground water rights are, generally, subject to the same requirements as for surface water rights. All applications are reviewed by WDFW. The four-part test is applied. If there is a concern that water uses might adversely impact fish, for example due to hydraulic continuity, WDFW will recommend that the right not be issued or that any use granted be conditioned on minimum flows. In most cases, Ecology will accept WDFW's recommendation and condition the right in such a way that flows are protected. The impact of a ground water withdrawal on a surface water body (stream or lake) through hydraulic continuity is generally estimated based on aquifer characteristics and accepted hydrogeologic study methods.

Historically few approved ground water uses were issued interruptible with a condition on instream flows. After the 1980's that practice changed. The science of ground water development and tools for assessing ground water flow became more advanced. Moreover, Ecology's understanding of the law on ground water hydraulic continuity was shaped, in part, by the Supreme Court's decision in *Postema v. Ecology (2000).* Now a ground water development's impact to existing wells and surface water sources is evaluated within the impairment analysis.

Groundwater Allocations (permit exempt)
New ground water can be obtained from permit-exempt wells under specific conditions (RCW 90. 44.050). The groundwater permit exemption is an exemption from a water right permit application; all other water laws and regulations still apply. Currently, the local health district and building permit officials determine when permit exempt wells can be used. In general, there are few restrictions on location except for sanitary setbacks.

As a water right, use of a permit exempt well can be regulated in favor of senior rights if it impairs an existing right, including instream flows. Historically, Ecology has rarely regulated these water rights to protect senior water rights.

Changes or Transfers of Water Rights (Water Right Permits)
Existing water rights can be changed or transferred pursuant to chapters 90.03 and 90.44 RCW.

Reservations of water
There are no existing reservations of water within WRIA 3 & 4.

Closures of water sources in WRIA 3 & 4
There are currently a few streams closed to future appropriations in WRIA 3 & 4 based on Ecology's SWSL list. Closures are based on a finding of no water availability, generally because the available supply has been fully allocated.

RULE IMPACTS TO WATER RIGHT ADMINISTRATION

The future water right management program under the proposed rule can be broken down as follows:

Surface Water Allocations (water right permit)
Before Ecology can approve a water right application for a new public water system, the applicant must provide sufficient documentation that no other public water system can provide water in a timely and reasonable manner. If domestic water can be provided in a reasonable and timely manner by some other public water system, Ecology shall reject the water right application.

New applications for surface water rights will still be forwarded to the WDFW for review and comment and the four-part test will be applied. In cases where the proposed withdrawals may impact instream needs, WDFW will recommend that the right not be issued or that any use granted be conditioned on the existing rule's minimum flows. In most cases Ecology will accept WDFW's recommendation and condition the right in such a way that flows are protected. Surface water allocations are also subject to interruption under Chapter 173-503 WAC.

Under the proposed rule and since the 2001 establishment of instream flows, all new water rights are "junior" to the published instream flow values and be required to stop withdrawals when minimum flows are not met in the surface water source. Applications

for new surface water rights from closed sources would be denied, unless the applicant proposed mitigation of the water use or the use was approved subject to over riding considerations of the public interest. For those areas currently closed, this would represent no change from the current situation. For areas that are not currently closed, this may represent a change.

The rule amendment will ensure uniformity and consistency in flow determinations and resultant instream flow provisos.

Groundwater Allocations (water right permits)

Before Ecology can approve a water right application for a new public water system, the applicant must provide sufficient documentation that no other public water system can provide water in a timely and reasonable manner. If domestic water can be provided in a reasonable and timely manner by some other public water system, Ecology shall reject the water right application.

New applications for ground water rights are, generally, subject to the same requirements as for surface water rights. The four-part test is applied. All applications will still be reviewed by WDFW and if there is a concern that water uses might adversely impact fish, WDFW will recommend that the right be so conditioned as to provide for in the instream flow rule. In most cases, Ecology will accept WDFW's recommendation and condition the right in such a way that flows are protected. The impact of a ground water withdrawal on a surface water body (stream or lake) through hydraulic continuity will generally still be estimated based on aquifer characteristics and accepted hydrogeologic study methods. If the proposed appropriation were to capture water, that would otherwise contribute to instream flows, the permit approval would be conditioned as interruptible to protect against impairment of the instream flow right.

Applications for new ground water rights from closed sources would be denied, unless the applicant proposed mitigation of the water use or the use was approved subject to over riding considerations of the public interest. For those areas currently closed, this would represent no change from the current situation. However, for areas that are not currently closed, this may represent a change since new ground water rights would be denied, unless the applicant proposed mitigation of the water use of the use was approved subject to over riding considerations of the public interest.

As mentioned above, groundwater rights are subject to the same requirements as for surface water rights. However, in the past, groundwater rights have not been conditioned due to the difficulty in knowing impacts to surface sources based on the degree of continuity. The proposed amendment clarifies the applicant's responsibility in demonstrating that groundwater extraction will not impair other rights. However, the impact created on the surface water source via hydraulic continuity is not necessarily impairment. A separate statutory requirement exists to analyze the possibility of impairment from withdrawals of ground and surface waters in continuity. This proposed amendment and the existing rule do not affect this statutory requirement.

Groundwater Allocations (permit exempt)

Some portions of the Skagit basin are closed to new ground water development under the proposed rule amendment, with exceptions provided for in the rule. The reservation of permit-exempt ground water for future domestic, small business, and public water supply uses will provide for a management framework for these types of withdrawals. Because access to the reservations requires local governments to take certain steps, one of the most significant factors influencing impacts from the proposed rule is whether the local governments enact an ordinance or other administrative action to effectuate the reservation. If an agreement or ordinance is not put in place by local governments, then no reservation water is available. The analysis below assumes that local governments complete the required agreement or ordinance. The Appendix discusses the case where no ordinance is promulgated.

If there is no reservation in effect, and certain streams or basins are closed to new appropriation, then no new permit exempt wells would be drilled in those areas. If the reservation is in effect, and water is being used, there are still several water management conditions that may have an impact on water use including restrictions on outdoor use.

For individuals and business entities, there are several alternatives. Applicants may choose as a first order of business to solicit a hydrogeologist to certify that a well would not cause an impairment of a water right in those areas where hydraulic continuity is unlikely. This would allow an applicant to develop a well without the limitations imposed by the existing rule's instream flows and without the limitations imposed by the proposed amendment. However, the applicant would bear the additional cost of the analysis. For some wells in basins that drain groundwater to saltwater bodies, the cost for hydrogeologic consultation would likely be very small. For those applicants wishing to use water in areas with a likelihood of hydraulic continuity and consequently, impairment of instream flows, they could get water from the reservation or accept an interruptible water right.

Obtaining water from the reservation requires that an applicant be located more than 500 feet from an existing water system. If an applicant is closer than this, then they will be required to connect to a public water system if the connection can be made available in a timely and reasonable manner. This may result in increased costs including connection charges, construction charges and monthly water rates.

Changes or Transfers of Water Rights

Existing water rights can continue to be changed or transferred pursuant to chapters 90.03 and 90.44 RCW. Changes to surface water rights will include consideration of the instream flow right. Transfers of point of diversion downstream or upstream on a source may be restricted based on in-stream flows from the rule. Changes in point of diversions from a surface point to a ground water point from the same water source will probably not be impacted by the rule. Transfers that are restricted may represent a cost for those that would have preferred to trade water.

Reservations of water

The reservation of water, use of water under the reservation and associated conditions for that use are all new proposals. In large measure, the reservation will allow use of permit-exempt wells without them being subject to the instream flow right. These uses are subject to limitations on outdoor watering. Use of water under the domestic use reservation is conditioned as follows:

(a) The water reserved shall be for ground water uses exempt from a water right permit application pursuant to RCW 99.44.050.
(b) The quantities of reserved ground water are set by tributary basin in rule.
(c) Domestic water use shall meet the water use efficiency standards of the uniform plumbing code as well as any applicable local or state requirements for conservation standards.
(d) This reservation shall only be available for use in areas governed by a county ordinance or other administrative action that sets forth the same requirements as subsections a, b, c, e, f and g of the proposed WAC 173-503-073(2) as conditions on a water availability determination based upon the reservation, issued pursuant to RCW 19.27.097 and RCW 58.17.110.
(e) Water use under this reservation is not allowed in those areas where a public water system has been established pursuant to RCW 43.20.260, and where the connection can be provided in a timely and reasonable manner. A "timely and reasonable manner" means potable water service can be provided by a purveyor within 120 days of a written request for service, to a property located within the public water system and 500 feet of the purveyor's water pipe line.
(f) Outdoor irrigation shall be limited to an area not to exceed a total of $1/12^{th}$ of an acre and under all circumstances, total outdoor watering for six or more residences under the permit exemption (RCW 90.44.050) shall not exceed ½ acre.

If the proposed rule amendment goes into effect, then use of the permit-exempt well water will now have to be obtained from a reservation if year-around use is desired. Businesses that elect to install permit exempt wells for their own moderate needs or to develop saleable land will face more choices as to their best option. After the rule is amended, the project proponent may choose other methods of water well development (for example drilling to deep aquifers) to meet their needs and avoid limitations imposed by the rule.

The rule amendment also proposes a future stock watering reservation for stock water as directed by RCW 90.22.040. Future stock watering in the proposed rule is accessed via either a diversion structures or wells and relates to normal grazing activities for the surface water use. In addition, RCW 90.44.050 provides an exception to the requirements for a ground water right permit for stockwater. The rule sets a volume limit on this use of water but otherwise does not change the existing situation.

Closures of Water Sources in WRIA 3 & 4

The proposed rule amendment will include most of the current limitations on water withdrawals based upon the SWSL list but also adds to them. Ecology anticipates denying applications from closed sources unless the applicant can mitigate for the

impacts. This was true before the proposed rule amendments but after the amendments become effective the areas subject to closure will enlarge.

Maximum Allocation
There is an existing 200 CFS maximum interruptible allocation in the existing rule that is not changed in the rule amendment.

PROPOSED RULE (CHAPTER 173-503 WAC)

The complete rule language for existing instream flows in WRIA 3 and 4 can be found in Chapter 173-503 WAC. The following provides a brief description of the amended rule and further discussion of those specific rule provisions that may relate to out-of-stream uses of water.

Chapter 173-503-010 General Provisions
The rule applies to all future uses of surface and groundwater within the Skagit water resources inventory area (WRIA 3 and 4) excluding the Samish river subbasin, Fidalgo, Guemes, Cypress, Hope and Goat islands.

Conclusion: No change[13]

Chapter 173-503-020 Purpose
The purpose of the proposed rule is to retain perennial rivers, streams and lakes within the Skagit water resources inventory area and Cultus Mountain tributaries with instream flows and levels. The amended section will create a reservation to satisfy human domestic needs and a reservation for stock watering.

Conclusion: No significant economic impact-see "Rule Impacts to Water Right Administration"

Chapter 173-503-025 Definitions
See the proposed rule.

Conclusion: No significant economic impact-see "Rule Impacts to Water Right Administration"

Chapter 173-503-030 Findings
See the proposed rule.

Conclusion: No change

Chapter 173-503-040 Establishment of Instream Flows
This section establishes the locations of the gauges (control points) where instream flows will be measured and establishes stream management reaches.

[13] This conclusion and those that follow are evaluating the change in rule requirements from the existing rule (WAC 173-503) to the proposed rule amendment.

Conclusion: No change

Chapter 173-503-050 Water Availability Determination
The department has determined that two hundred cubic feet per second are available to be appropriated through groundwater withdrawal or surface water diversion but will be subject to instream flows. This can be revisited depending on the time period.

Conclusion: No change

Chapter 173-503-051 Stream Closures
Ecology is proposing closing many of the tributary sub-basins to year around use. This includes surface and groundwater permits and groundwater withdrawals otherwise exempted from permit requirements. Several streams are not closed and will be available for allocation subject to instream flows.

Conclusion: Closure may impact the ability to obtain water in some locations-see "Rule Impacts to Water Right Administration"

Chapter 173-503-060 Future Permitting Actions
All new applications for domestic water rights from the reservations must show that water is not available in a timely and reasonable manner. Surface and groundwater permits that are not subject to instream flows may be issued if the proposed use is non-consumptive, uses a reservation as its source proposes Ecology approved mitigation. In all cases, it must not impair senior water rights.

Based on the hydrogeology of the basin and location and depth of where groundwater withdrawals generally occur, most of the water in the basin is likely to be in hydraulic continuity with surface water flows and lakes. New consumptive groundwater uses that are in hydraulic continuity with surface water will be subject to instream flows. New consumptive groundwater uses that are not in hydraulic continuity or that will not impair instream flows may be approved without conditioning them on the instream flows in the existing rule. The burden of analysis will be on the applicant to demonstrate that impairment will not occur via a sufficient hydrogeologic analysis.

Permits in open basins may be issued but they will be junior to instream flows. All permitted uses will be required to meter.

Conclusion: Demonstrating lack of continuity or additional mitigation measures are clarifications of existing permit requirements. Meters are currently required for all permitted uses. See "Rule Impacts to Water Right Administration"

Chapter 173-503-070 Exemptions
No existing rights shall be impacted

Conclusion: No change

Chapter 173-503-071 Lakes and Ponds
Lakes and ponds shall be protected and where possible, enhanced.

Conclusion: No significant economic impact -see "Rule Impacts to Water Right Administration"

Chapter 173-503-073 Domestic Ground Water Reservation
The department is proposing setting up a reservation for domestic uses and the human health requirements of small businesses that will be uninterruptible and will require that efficiency standards meet the UPC, and that the county establish an ordinance or other administrative action that indicates the counties will implement the rule and its conditions. In subbasins that are not being closed, permit-exempt uses that do not use the reservation may be allowed, but will be interruptible as required to maintain senior instream flows. Interruptible ground water withdrawals may not be adequate for all purposes.

Water from the reservation is unavailable to those who can receive water from a local purveyor in a timely and reasonable manner. No outdoor irrigation will be allowed exceeding a total of $1/12^{th}$ of an acre for individual, residential outdoor uses, with 6 or more residences being limited to ½ acre of outdoor irrigation. Specific accounting criteria will also be set up and the department shall provide notification when the reservation has been consumed and is no longer available.

Conclusion: In most cases, establishment of a reservation will increase the allowed use of water during low flow years and result in a benefit to out of stream uses. In-stream effects may occur. Some proposed uses will not be able to obtain the same quantity of water during other times of the year as they can under the existing rule. See "Rule Impacts to Water Right Administration"

Chapter 173-503-074 Establishment of Subbasin Management Units and Reservation Quantities by Subbasin Management Units
Ecology is proposing to establish subbasin management units. For each subbasin unit, Ecology indicates whether it is closed to new allocations and what amount, if any, is reserved for domestic uses within the subbasin.

Conclusion: Establishing the maximum amount of water could put a cap on development if it is less than required for build-out (see SEPA). Basin closures will eliminate permitted surface and groundwater withdrawals. Potential significant economic impacts- see "Rule Impacts to Water Right Administration"

Chapter 173-503-075 Stock Watering Reservation
Ecology is proposing to reserve 130,000 gallons per day for future stock watering accessed via either diversion structures or wells; the withdrawals must be related to normal grazing activities

Conclusion: The current rule would require water rights obtained for stockwatering to be junior to instream flows. The proposed rule will provide for use during low flow times and should beneficially impact potential users-see "Rule Impacts to Water Right Administration"

Chapter 173-503-080 Policy Statement for Future Permitting Actions
This section has been deleted.

Conclusion: No significant economic impact-see "Rule Impacts to Water Right Administration"

Chapter 173-503-081 Future Changes and Transfers
Transfers will only be allowed if they don't conflict with this chapter

Conclusion: No significant economic impacts-see "Rule Impacts to Water Right Administration"

173-503-090 Compliance and Enforcement
The department will prepare and distribute technical and educational information regarding the chapter. Voluntary compliance is preferred.

Conclusion: Technical and educational materials will be a cost of the proposed rule amendment-see "Rule Impacts to Water Right Administration"

173-503-100 Alternative Sources of Water
The department encourages the use of alternative sources of water.

Conclusion: No significant economic impact-see "Rule Impacts to Water Right Administration"

173-503-110 Establishment of Trust Water Rights Program
A trust water rights program will be established to acquire water rights.

Conclusion: No significant economic impact-see "Rule Impacts to Water Right Administration"

173-503-120 Map
See the proposed rule.

Conclusion: No significant impact-see "Rule Impacts to Water Right Administration"

173-503-130 Appeals
All decisions can be appealed to the pollution control hearings board

Conclusion: No significant economic impact-see "Rule Impacts to Water Right Administration"

173-503-140 Regulation Review
This rule may be reviewed and revised

Conclusion: No significant economic impact--see "Rule Impacts to Water Right Administration"

173-503-150 Water Rights Subject to Instream Flows Predating the Reservation
Water rights commenced prior to the effective date of the reservation may participate in the reservation provided they agree to change their priority date to that of the reservation and comply with the conditions applicable to the reservation.

Conclusion: No significant economic impact-see "Rule Impacts to Water Right Administration"

APPENDIX B: INSTREAM FLOW RESEARCH

Determining the value of in-stream flows has been considered in several previous academic papers. The results indicate a fairly wide range of estimates, but this is to be expected since the value of additional water in rivers is a function of the existing flow levels, river development, recreational opportunities, other recreational opportunities, fish availability, location on the river, etc. Moreover the analysis is made difficult since instream flows have public goods characteristics and the value is not revealed in markets. The studies cited below are intended to provide a sense of valuations obtained in other areas. No studies specific to the Skagit River were carried out as part of this analysis due to resource constraints.

Loomis (1987) provides an overview of the economic theory and early analyses of instream flows. He discusses market and simulated methodologies for determining the value of instream flows. The values cited in the paper range from $15.75 to $74.00 acre-ft/day.

Johnson & Adams (1988) analyzed the John Day River in north central Oregon. They evaluated the benefits of flow on steelhead and the study is unique in that it quantified the relationship between streamflow and fishery productivity and used non-market valuation techniques to consider the economic benefits of changes in fishing quality. They found the value of summer flow to be $2.36 per acre-ft over the three month summer period.

Loomis and Cooper (1990) considered the value of instream flows for recreational fishing along the Feather River in northern California. They use a flow-fish model and link it to a travel cost model to determine the value of increased flows. They find that a 20% increase in flow is worth about $72.90 per cfs for this specific location.

Duffield, Neher and Brown (1992) estimated the recreation benefits of instream flow along Montana's Big-Hole and Bitterroot rivers. They found a marginal recreational value from instream flows of approximately $50 per acre-foot plus $25 per acre-foot for downstream hydroelectric generation.

Berrens, Ganderton and Silva (1996) estimated the benefits of instream flow used for protection of endangered species for households in New Mexico. They found that the estimates ranged form $28.73 to $89.68 for households in New Mexico.

A summary of the analyses is provided in Table B.6.

Table B.6. Empirical Estimates of the Value of Instream Flow

Authors	Estimate	Comments	Estimate
Loomis (1987)	$15.75-$74.00 ac-ft/day	Benefit estimates reflect four different studies	$0.15-$0.69 ac-ft/summer
Johnson & Adams (1988)	$2.36 ac-ft/summer (1987$)	Benefits only consider recreational	$2.36 ac-ft/summer

		fishing for one species	
Loomis & Cooper (1990)	$72.90/cfs/summer		$3,926.9 ac-ft/summer
Duffield, Neher and Brown (1992)	$50 /ac-ft		
Berrens, Ganderton and Silva (1996)	$28.73 to $89.68 per household		N/A

As can be seen, the values vary a lot based on the type of analysis, specific river, etc. Several of the studies give values in acre-feet/year that are smaller than the costs calculated above in acre-ft/year.

APPENDIX C: DESCRIPTION OF BENEFITS AND COSTS WITHOUT LOCAL GOVERNMENT IMPLEMENTING AGREEMENTS

There is a possibility that even if the rule amendment goes into effect, that the local governments won't establish an implementing agreement for the rule. If this occurs, then the reservation will not go into effect and the cost and benefits of the rule might change significantly. Existing water right holders should still not be directly affected. A general description of benefits and costs associated with instream and out of stream uses of water if no implementing agreement is established is provided below.

Costs

The economic cost associated with this rulemaking is the loss in the value of the water in its alternative use. This may be the lost value of the water in the streams and tributaries when additional water is allowed to be withdrawn or the value of the water for out of stream uses when it is required to remain in the streams. These can be described more specifically as follows:

Ecosystem Goods and Services

The opening of the East Nookachamps basin will result in groundwater withdrawals that may, in turn, reduce streamflows more than would have been the case without the proposed rule amendment. Reduced water in the river and creeks could yield reduced habitat for fish and other marine and avian life and reduce water quality affecting the river's ability to better assimilate waste. This could also be an impact to any businesses relying on the river for waste assimilation, or for biological processes.

Recreation

Reducing the amount of water in the river and tributaries could also impact some recreational activities by reducing the quality of the experience from what would have been the case without the rule amendment. Boating, fishing, windsurfing, kayaking, and canoeing, swimming or diving could be impacted along with activities adjacent to the water like picnicking and camping. Businesses associated with these activities could also be affected.

Reduced Availability of Water for Out- of-Stream Uses

(a.) Closing additional subbasins: Some subbasins that are currently open to new withdrawals will be closed. This regulation will eliminate new permitted and permit – exempt water withdrawals, unless non-consumptive, fully mitigated or not in continuity, in these areas and new water uses will be required to obtain water from an existing water purveyor, establishing deep wells, through transfers or other methods.

Non-Use & Option Value

Non-use values such as spiritual and existence values could be impacted as part of this rulemaking. These values do not derive either from direct or potential use of water resources in the basin, and represent a different category of value than the use values listed above.

Uncertainty and option values may also be important. There is a significant amount of uncertainty associated with water and instream flows. The future may determine that more or less water should be maintained in the river. However, a water right is a firm commitment to provide water in perpetuity. By allowing all water permits in previously closed basins, the option to restrict these flows in the future is eliminated.

Implementation Costs
The proposed rule will involve some implementation costs. These include the costs associated with providing technical and educational information for rule compliance.

Benefits
The benefits associated with the proposed rule are associated with the value of water in its proposed use. This includes the following:

Ecosystem Goods and Services
There will be some ecosystem benefits from stream closures and from connectivity requirements. These requirements will likely result in more water in the rivers than would have been the case without the rule amendment. Connection requirements might reduce impacts to locally sensitive streams. An avoided reduction of instream flow in tributaries could yield an avoided reduction in habitat for fish and other marine and avian life and avoid a reduction in the river's ability to better assimilate waste. This could be a benefit for any businesses relying on the river for waste assimilation, or for biological processes.

Recreation Benefits
There may be some recreational benefits associated with stream closures and from connectivity requirements. These requirements will likely retain more water in the rivers than would have been the case without the rule amendment. Connection requirements might reduce impacts to locally sensitive streams. An avoided reduction of instream flow in tributaries could yield a beneficial impact to rafters, those who canoe, fishing quality, and riverside activities.

Benefits to Out-of-Stream Water Use
(a.) Improved Water Allocation Process
The new rule will clearly indicate closed and open basins. This will reduce the uncertainty surrounding whether or not new water rights will be approved or denied and allow for greater certainty. It will also likely reduce the amount of review and analysis required and potentially cut down on the amount of disputes over water use. This will likely allow greater certainty in investment decisions, and reduce the number of applicants who apply if it is clear that it is unlikely they will get a water right.